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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,194	12/28/2001	Shahram Shah-Heydari	91436-347	5400

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SMART AND BIGGAR
438 UNIVERSITY AVENUE
SUITE 1500 BOX 111
TORONTO, ON M5G2K8
CANADA

EXAMINER	
TRAN, AMY	

ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/029,194	SHAH-HEYDARI, SHAHRAM	
	Examiner	Art Unit	
	Amy Tran	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/8/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the application filed on December 28, 2001. Claims 1-27 are pending examination. Claims 1-27 represent hierarchical tree-based protection scheme for mesh networks.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Lamport et al. (hereafter Lamport) US Patent 5,138,615.

As to claim 1, Lamport teaches a method of extending a spanning hierarchical protection tree in a mesh network (fig 17) comprising:

at a current node, receiving an invitation to become a child of a first adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information);

if a minimum capacity along a protection path from said current node to a root node of the spanning hierarchical protection tree which visits the first adjacent node is greater than a minimum capacity of any existing protection path from said current node to said root node: designating said first adjacent node as a primary parent of said current node in said tree; and from said current node, sending an invitation to become a

child of said current node in said tree to each adjacent node of said current node that is not said first adjacent node (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information from its neighbors with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 2, Lamport teaches the method of claim 1, Lamport further teaches if said minimum capacity along said protection path from said current node to said root node which visits the first adjacent node is not greater than said minimum capacity of any existing protection path from said current node to said root node: designating said first adjacent node as a backup parent of said current node in said tree (column 38 line 50 – column 39 line 59, switch 's port information array stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 3, Lamport teaches the method of claim 1 and claim 2, wherein said backup parents is one of a number of backup parents of said current node, each one of said number of backup parents having a priority based on a minimum capacity of a protection path from said current node to said root node which visits said one of said number of backup parents, with a higher minimum capacity being associated with a higher priority (column 38 line 50 – column 39 line 59, switch 's port information array

stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 4, Lamport teaches the method of claim 1, claim 2 and claim 3, Lamport further teaches ensuring that said designating of said first adjacent node as a primary parent of said current node does not introduce a loop into said spanning hierarchical protection tree (column 7 line 59 – column 9 line 46, preventing deadlock by using a new type of routing procedure which automatically routes messages in spanning tree).

As to claim 5, Lamport teaches a method of reconnecting a node disconnected from a spanning hierarchical protection tree in a mesh network to the spanning hierarchical protection tree (fig 17) comprising:

designating a backup parent of said disconnected node in said tree to be a primary parent of said disconnected node in said tree (column 6 lines 35-46, column 38 line 51 – column 39 line 59, each switch stores information regarding each of the switch's immediate neighbor, these immediate neighbors are read as backup parents); and from said disconnected node, sending an invitation to become a child of said disconnected node in said tree to each adjacent node of said disconnected node that is not said primary parent (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position).

As to claim 6, Lamport teaches a method of connecting an auxiliary node to a spanning hierarchical protection tree in a mesh network (fig 17) comprising:

receiving an invitation from each adjacent node of said auxiliary node for said auxiliary node to become a child of said adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information); and designating as a primary parent of said auxiliary node the one adjacent node that is visited by a protection path from said auxiliary node to a root node of said spanning hierarchical protection tree whose minimum capacity is at least as large as the largest minimum capacity of all existing protection paths from said auxiliary node to said root node (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 7, Lamport teaches a computing device comprising:

a processor (fig 8, column 13 line 38 – column 15 line 29, switch control processor 216);

memory in communication with said processor, storing processor readable instructions adapting said device to extend a spanning hierarchical protection tree in a mesh network (column 47 line 35 – column 48 line 33, a new routing table is generated in the switch control processor's memory) by:

at a current node, receiving an invitation to become a child of a first adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information); and if a minimum capacity along a protection path from said current node to a root node of the spanning hierarchical protection tree which visits the first adjacent node is greater than a minimum capacity of any existing protection path from said current node to said root node, designating said first adjacent node as a primary parent of said current node in said tree (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 8, Lamport teaches the computing device of claim 7, wherein said instructions further adapt said device to:

if said minimum capacity along said protection path from said current node to said root node which visits the first adjacent node is greater than said minimum capacity of any existing protection path from said current node to said root node, send from said current node an invitation to become a child of said current node in said tree to each adjacent node of said current node that is not said first adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information).

As to claim 9, Lamport teaches the computer device of claim 7 and claim 8, wherein said memory further comprises instructions adapting said device to:

If said minimum capacity along said protection path from said current node to said root node which visits the first adjacent node is not greater than said minimum capacity of any existing protection path from said current node to said root node, designate said first adjacent node as a backup parent of said current node in said tree (column 38 line 50 – column 39 line 59, switch 's port information array stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 10, Lamport teaches the computing device of claim 7, claim 8 and claim 9, wherein said backup parent is one of a number of backup parents of said current node, each one of said number of backup parents having a priority based on a minimum capacity of a protection path from said current node to said root node which visits said one of said number of backup parents, with a higher minimum capacity being associated with a higher priority (column 38 line 50 – column 39 line 59, switch 's port information array stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 11, Lamport teaches the computing device of claim 7, claim 8, claim 9 and claim 10, wherein said instruction further adapt said device to insure that said designating of said first adjacent node as a primary parent of said current node does not

introduce a loop into said spanning hierarchical protection tree (column 7 line 59 – column 9 line 46, preventing deadlock by using a new type of routing procedure which automatically routes messages in spanning tree).

As to claim 12, Lamport teaches a computing device comprising:

a processor (fig 8, column 13 line 38 – column 15 line 29, switch control processor 216);

memory in communication with said processor, storing processor readable instructions adapting said device to reconnect a node disconnected from a spanning hierarchical protection tree in a mesh network to the spanning hierarchical protection tree (column 47 line 35 – column 48 line 33, a new routing table is generated in the switch control processor's memory) by:

designating a backup parent of said disconnected node in said tree to be a primary parent of said disconnected node in said tree; and from said disconnected node sending an invitation to become a child of said disconnected node in said tree to each adjacent node of said disconnected node that is not said primary parent (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 13, Lamport teaches the computing device of claim 12, wherein said instructions further adapt said device to: for each said adjacent node:

if said minimum capacity along a protection path from said auxiliary node to said root node of the spanning hierarchical protection tree which visits said adjacent node is not greater than said minimum capacity of any existing protection path from said auxiliary node to said root node, designate said adjacent node as a backup parent of said auxiliary node in said tree (column 38 line 50 – column 39 line 59, switch 's port information array stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 14, Lamport teaches a computing device comprising:

a processor (fig 8, column 13 line 38 – column 15 line 29, switch control processor 216);

memory in communication with said processor, storing processor readable instructions adapting said device to connect an auxiliary node to a spanning hierarchical protection tree in a mesh network (column 47 line 35 – column 48 line 33, a new routing table is generated in the switch control processor's memory) by:

receiving an invitation from each adjacent node of said auxiliary node for said auxiliary node to become a child of said adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information); and

designating as a primary parent of said auxiliary node the one adjacent node that is visited by a protection path from said auxiliary node to a root node of said spanning hierarchical protection tree whose minimum capacity is at least as large as the largest minimum capacity of all existing protection paths from said auxiliary node to said root node (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 15, Lamport teaches a computing device comprising:

a processor (fig 8, column 13 line 38 – column 15 line 29, switch control processor 216);

memory in communication with said processor, storing processor readable instructions adapting said device to connect an auxiliary node to a spanning hierarchical protection tree in a mesh network (column 47 line 35 – column 48 line 33, a new routing table is generated in the switch control processor's memory) by:

requesting an invitation from each adjacent node of said auxiliary node for said auxiliary node to become a child of said adjacent node; from each said adjacent node, receiving an invitation to become a child of said adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information); and

for each said adjacent node: if a minimum capacity along a protection path from said auxiliary node to a root node of the spanning hierarchical protection tree which visits said adjacent node is greater than a minimum capacity of any existing protection path from said auxiliary node to said root node, designating said adjacent node as a primary parent of said auxiliary node in said tree (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent"); and

from said auxiliary node, sending an invitation to become a child of said auxiliary node in said tree to each further adjacent node of said auxiliary node that is not said primary parent adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position, these immediate neighbors are read as backup parents).

As to claim 16, Lamport teaches computer readable medium storing computer software that, when loaded into a computing device, adapts said device to extend a spanning hierarchical protection tree in a mesh network (fig 17) by:

at a current node, receiving an invitation to become a child of a first adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position); and

if a minimum capacity along a protection path from said current node to a root node of the spanning hierarchical protection tree which visits the first adjacent node is greater than a minimum capacity of any existing protection path from said current node to said root node, designating said first adjacent node as a primary parent of said current node in said tree (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 17, Lamport teaches the computer readable medium of claim 16, wherein said software is further capable of adapting said device by:

if said minimum capacity along said protection path from said current node to said root node which visits the first adjacent node is greater than said minimum capacity of any existing protection path from said current node to said root node, sending from said current node an invitation to become a child of said current node in said tree to each adjacent node of said current node that is not said first adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information).

As to claim 18, Lamport teaches the computer readable medium of claim 16 and claim 17, wherein said software is further capable of adapting said device by:

if said minimum capacity along said protection path from said current node to said root node which visits the first adjacent node is not greater than said minimum capacity of any exiting protection path from said current node to said root node, designating said first adjacent node as a backup parent of said current node in said tree (column 38 line 50 – column 39 line 59, switch 's port information array stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 19, Lamport teaches the computer readable of claim 16, claim 17 and claim 18, wherein said backup parent is one of a number of backup parents of said current node, each one of said number of backup parents having a priority based on a minimum capacity of a protection path from said current node to said root node which visits said one of said number of backup parents, with a higher minimum capacity being associated with a higher priority (column 38 line 50 – column 39 line 59, switch 's port information array stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 20, Lamport teaches the computer readable of claim 16, claim 17, claim 18 and claim 19, wherein software is further capable of adapting said device to extend a spanning hierarchical protection tree in a mesh network by ensuring that said designating of said first adjacent node as a primary parent of said current node does not introduce a loop into said spanning hierarchical protection tree (column 7 line 59 –

column 9 line 46, preventing deadlock by using a new type of routing procedure which automatically routes messages in spanning tree).

As to claim 21, Lamport teaches a computer readable medium storing computer software that, when loaded into a computing device, adapts said device to reconnect a node disconnected from a spanning hierarchical protection tree in a mesh network to the spanning hierarchical protection tree by:

designating a backup parent of said disconnected node in said tree to be a primary parent of said disconnected node in said tree (column 6 lines 35-46, column 38 line 51 – column 39 line 59, each switch stores information regarding each of the switch's immediate neighbor, these immediate neighbors are read as backup parents); and

from said disconnected node, sending an invitation to become a child of said disconnected node in said tree to each adjacent node of said disconnected node that is not said primary parent (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position).

As to claim 22, Lamport teaches the computer readable medium of claim 21, wherein said software is further capable of adapting said device by:

for each said adjacent node, if said minimum capacity along a protection path from said auxiliary node to said root node of the spanning hierarchical protection tree which visits said adjacent node is not greater than said minimum capacity of any

existing protection path from said auxiliary node to said root node, designating said adjacent node as a backup parent of said auxiliary node in said tree (column 38 line 50 – column 39 line 59, switch 's port information array stores information regarding each of the switch's immediate neighbors, these immediate neighbors are read as backup parents).

As to claim 23, Lamport teaches computer readable medium storing computer software that, when loaded into a computing device, adapts said device to connect an auxiliary node to a spanning hierarchical protection tree in a mesh network (fig 17) by:

receiving an invitation from each adjacent node of said auxiliary node for said auxiliary node to become a child of said adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information); and designating as a primary parent of said auxiliary node the one adjacent node that is visited by a protection path from said auxiliary node to a root node of said spanning hierarchical protection tree whose minimum capacity is at least as large as the largest minimum capacity of all existing protection paths from said auxiliary node to said root node (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 24, Lamport teaches computer readable medium storing computer software that, when loaded into a computing device, adapts said device to connect an auxiliary node to a spanning hierarchical protection tree in a mesh network by:

requesting an invitation from each adjacent node of said auxiliary node for said auxiliary node to become a child of said adjacent node; from each said adjacent node, receiving an invitation to become a child of said adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position); and

for each said adjacent node: if a minimum capacity along a protection path from said auxiliary node to a root node of the spanning hierarchical protection tree which visits said adjacent node is greater than a minimum capacity of any existing protection path from said auxiliary node to said root node: designating said adjacent node as a primary parent of said auxiliary node in said tree (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent"); and

from said auxiliary node, sending an invitation to become a child of said auxiliary node in said tree to each further adjacent node of said auxiliary node that is not said primary parent adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position).

As to claim 25, Lamport teaches computer readable medium storing computer software that, when loaded into a computing device, adapts said device to extend a spanning hierarchical protection tree in a mesh network by:

at a current node, receiving an invitation to become a child of an adjacent node, said invitation providing an indication of a minimum capacity of a protection path from said current node to a root node of the spanning hierarchical protection tree which visits the adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position); and

designating said adjacent node as a primary parent in said tree of said current node if said indicated minimum capacity is greater than a minimum capacity of any existing protection path from said current node to said root node (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

As to claim 26, Lamport teaches a computer readable medium storing computer software that, when loaded into a computing device, adapts said device to reconnect a node disconnected from a spanning hierarchical protection tree in a mesh network to the spanning hierarchical protection tree by:

designating a backup parent of said disconnected node in said tree to be a primary parent of said disconnected node in said tree (column 6 lines 35-46, column 38

line 51 – column 39 line 59, each switch stores information regarding each of the switch's immediate neighbor, these immediate neighbors are read as backup parents); and

from said disconnected node, sending an invitation to become a child of said disconnected node in said tree to each adjacent node of said disconnected node that is not said primary parent, said invitation providing an indication of a minimum capacity of a protection path from said adjacent node to a root node of the spanning hierarchical protection tree which visits the disconnected node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position information).

As to claim 27, Lamport teaches computer readable medium storing computer software that, when loaded into a computing device, adapts said device to connect an auxiliary node to a spanning hierarchical protection tree in a mesh network by:

receiving an invitation from each adjacent node of said auxiliary node for said auxiliary node to become a child of said adjacent node, said invitation providing an indication of a minimum capacity of a protection path from said auxiliary node to a root node of the spanning hierarchical protection tree which visits said adjacent node (column 38 line 50 – column 39 line 58, each switch sends messages to its neighbors specifying that switch's asserted tree position); and

designating as a primary parent of said auxiliary node one adjacent node whose invitation indicates a minimum capacity at least as large as the minimum capacity

indicated in each other invitation (column 43 line 24 – column 46 line 45, each receiving switch compares receiving information with its own information and determines which set of information better meets the criteria for a proper spanning tree, if the received position is better, the receiving switch will identify the sending switch as its "parent").

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

-Rodeheffer et al. US Patent 6,614,764 discloses bridged network topology acquisition.

-Narvaez et al. US Patent 6,704,320 discloses dynamic algorithm for determining a shortest path tree between network nodes.

-Chiu et al. US Patent 6,134,599 discloses system and method for organizing devices in a network into a tree using suitability values.

-Narvaez-Guarnieri et al. US Patent 6,098,107 discloses dynamic algorithms for shortest path tree computation.

-Medard et al. US Patent 6,047,331 discloses method and apparatus for automatic protection switching.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy Tran whose telephone number is (571) 272-4243. The examiner can normally be reached on M-F from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

at
2/18/05

MOUSTAFA M. MEKY
PRIMARY EXAMINER